

Clinical Section

*A Clinical Study of Twenty-Five Cases of Diabetes Mellitus in Childhood

By

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INTRODUCTION

Diabetes of childhood is practically a new disease. Before 1922 a diabetic child almost never lived more than two years after the diagnosis was made. The briefest possible mention of this condition in childhood was made in text-books and all the references simply stressed the complete hopelessness of attempting to treat the disease. With the discovery of insulin in 1922, it became possible for the diabetic child to live. It is hard to realize that a disease which fourteen years ago had a mortality rate of 100%, now has a rate of only 1% per annum (these figures from Joslin). As the diabetic children of the post-insulin era continued to live, they wrote into the text-books the story of a new disease. New problems arose—heredity, growth, adolescence, premature arterio-sclerosis, enlargement of the liver and so on. It has been my good fortune to have been able to study 25 cases of diabetes mellitus in children in the past six years and this paper is simply a recital of clinical experiences and clinical impressions arising out of this study.

In 1930, at the suggestion of Dr. Gordon Chown, a diabetic clinic was established at the Children's Hospital. The original reason for the establishment of a diabetic clinic at the Children's Hospital under a single head was for the purpose of co-ordinating and standardizing treatment. It was felt that the mortality rate was too high, that cases were being admitted and re-admitted in coma too frequently, and that there was lack of proper supervision in the home. It was felt that the children coming in in coma were treated reasonably well but that on their recovery from coma they were being given inadequate diets—diets that were often distasteful to them, and that there was an almost complete lack of knowledge at home as to how the child should be looked after. The weakest part of the link seemed to be at the time the diabetic child was discharged from hospital. For several weeks the child had been kept in the hospital, his insulin administered, his diets given to him and very accurate and voluminous charts and histories kept. Then suddenly he was sent home—in many cases with no one at home who understood the disease adequately or knew how to deal with the various contingencies as they arose. The result was that every break in diet, every overdosage with insulin, every

acute infection meant a hospital visit and a stay of several weeks. The diabetic child became a "hospital child." Schooling was inadequate. Exercise was conspicuous by its absence.

The set-up for the clinic consisted of a co-ordinating group to which all public diabetic children were referred immediately upon diagnosis or admission. This consisted of:

1. *The hospital dietitian*, whose duty it was to prepare and plan the child's diet, and to teach the mother the weighing of foods and the essentials of the diet.

2. *The interne staff*, who carried out the active treatment of the cases in hospital under supervision, and who were responsible for instructing the mother or the child how to examine urine for sugar.

3. *The nursing staff*, who were responsible for accurate records and who taught the mother or the child the measuring and administration of insulin.

4. *The pathologist*, Dr. Bruce Chown, who carried out all necessary laboratory procedures.

5. *The nutritionist*, Miss Woodman, whose responsibility it was to see that no child was discharged from the hospital until someone at home was fully instructed in the care of the child. Then her job became one of follow-up to see that everything was made as easy as possible for the mother until she had developed the confidence so necessary to the proper management of the child.

6. Lastly, *The physician in charge*, who served the purpose of taking the credit for any good results that might ensue.

All this sounds very complicated and difficult and it may, perhaps, clarify matters if a typical case were followed through, from its first admission in coma. The parents have just recovered from the shock of seeing their child practically at death's door, and the awful realization that their child has an incurable disease is just dawning on them. While the patient's diet and insulin are being established, advantage is taken of the opportunity to educate the child if he is over eight years, and the mother, if he is under eight years. In children under eight years of age, the mother is asked to come down to the hospital each morning and the fundamentals of the disease are explained to her. She is told that her child will get along well and will not be denied anything but that her co-operation is essential to the successful carrying on of the case. She is told that although everything may seem discouraging and she has a great deal to learn that we will help her and see to it that everything goes well. She is taught to do a urine test for sugar and learns to appreciate the difference between a red, yellow, green and blue Benedict test. She is taken to the diet kitchen and taught how to weigh foods, how to substitute

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one food for another; she is asked to note down the foods commonly used in her own home and it is explained to her that her child's diet will differ very little from the diet of the rest of the family. His food will be weighed—their food will not. If the family has soup, roast beef, peas and tomatoes, pudding and milk, so will the child. Scales are bought and she is shown how to use her own scale.

Then the interne and the nursing staff take charge and explain the administration of insulin to her. She is shown how to sterilize the needle and syringe, how to measure insulin and, finally, is allowed to inject it herself under supervision. The importance of never omitting a dose of insulin is stressed. The signs and treatment of hypoglycaemia and of acute infections are taught. She is quizzed on all these points by myself, until there is complete assurance on both sides that the child is going home in competent hands.

If the child is over eight, many things may be taught him. Urinalysis certainly. Diet often. Self-administration of insulin can usually be taught children over nine, and the full significance of his disease with its complications of coma and shock, etc., is understood.

When the mother's schooling has been satisfactorily completed the child is sent home. The average first admission should not exceed two weeks. The Nutrition Worker visits the mother each day for a few days to help out with all the little odds and ends the mother had not thought of asking before. The urine specimens are carefully watched and if all the specimens are clear the insulin is slowly reduced until one slightly positive specimen is obtained a day. This is very important because a child's tolerance invariably improves after he gets home and starts full physical activity and a severe insulin reaction is apt to destroy the mother's confidence in her ability to handle her child and it may be very difficult to get her full co-operation afterward. The child is seen in the clinic, once a week for a month, at which time 24 hour specimens are examined and any slight adjustments in insulin which are necessary are made. The child's weight is watched to make sure that he is gaining satisfactorily. At each visit he is quizzed about insulin; about shock, about what to do if he has a fever, etc. Then the child is discharged to be seen once in three months for a year, and finally, twice a year. The place for the diabetic child is at home and not in the hospital, and once he is master of his disease he is far better off away from a hospital.

This seems like a great deal of work and fuss. The results would seem to justify its necessity. Nine of our cases have never been re-admitted to hospital for any reason whatsoever since their first admission in coma. One child has never been in hospital since he first came in in coma in 1930 at the age of eighteen months. Two have been re-admitted for infectious disease (Measles and Mumps), one for circumcision and one for tonsillectomy. Only three have been re-admitted in actual coma since their first admission.

That, in brief, is an outline of the way in which the clinic operates. And now for a consideration of some of the clinical features which these children present.

To date, we have had twenty-five children pass through the clinic. The youngest was eighteen months, the oldest was twelve years. Of these, fifteen were boys, and ten were girls.

ETIOLOGY

The cause of Diabetes Mellitus is not known. In the adult obesity, gall-bladder disease and thyroid pathology play a part; none of these factors play a part in childhood diabetes, as far as we know. In children, the important factors are:

1. Heredity.
2. Acute infections.
3. Endocrine pathology.

Heredity is undoubtedly a factor of the very greatest importance. Eleven of our twenty-five children had a family history of diabetes. One child gave a history of diabetes in five members of his family. It should also be remembered that the longer a diabetic child lives, the more diabetes do we find in his family. In one week last year, diabetes was diagnosed for the first time in relatives of two of our diabetics. It is not sufficient to ask a diabetic child about diabetes in his family on his first admission alone—each year the family history should be re-checked from this point of view. In addition the whole family of a diabetic child should be examined periodically for glycosuria. Joslin reports 53% of 73 diabetic children who have lived more than ten years have hereditary diabetes. Diabetes occurred seven times more often in the relatives of a diabetic child than in the relatives of a non-diabetic. We are only at the beginning of a study of heredity in diabetes. Prior to 1922, few diabetics married, and still fewer had viable children. Sterility was the rule. Under insulin therapy, diabetics are getting married in ever-increasing numbers and raising families, and it is from a study of their progeny that a final determination of the role of heredity in diabetes will be made.

Infection: The role of acute infections in the etiology of diabetes is a difficult one to appraise. Every child has two or three acute infections each year and yet the incidence of diabetes in childhood is very, very small. It is so easy to blame diabetes on the acute disease preceding it. We know that an acute infection may aggravate diabetes in a person who has it, but does an acute infection actually precipitate the disease? In our own series, as a rule, the incidence of acute infections preceding the onset of diabetes was, if anything, less than in the general childhood population.

Analysis of blood sugars has shown that acute infection, as a whole, does not affect sugar tolerance in children, except in mumps. Mommser and Mayer have shown that repeated blood sugar curves in children with mumps showed a diabetic

curve in severe cases on the fifth or sixth days. This did not occur early or late in the disease or in mild cases. Only one of our diabetics had mumps preceding onset of his disease, and in his case it preceded the diagnosis of diabetes by two years. One other developed mumps three years after diabetes had been diagnosed and suffered a marked loss in tolerance, which has persisted ever since.

Endocrines: The role of the endocrines, particularly the thyroid and the pituitary in the etiology of diabetes, is far from clear. The association of acromegaly with diabetes (25%), the frequency of over-height in diabetic children (86% Joslin), the production of hyperglycaemia during stimulation of the pituitary — all these have been brought forward as evidence that other endocrines besides the pancreas are at fault in this disease.

The whole problem of the relationship of the pituitary to the pancreas is still in the process of solution.

Diagnosis is comparatively simple. The presence of glycosuria with a fasting blood sugar of 140 mgms. or more, is definite evidence of Diabetes. The onset of the disease in childhood is very similar to its onset in adults—a history of excessive thirst, frequency of urination, progressive loss of weight,—these symptoms make a urine analysis for sugar imperative. One of our cases was treated as a nutritional problem for several weeks before sugar was looked for and discovered in the urine. Most of our cases did not consult a doctor until coma had supervened.

Diabetic Coma: The management of diabetic coma forms an important part of childhood diabetes, since most children are still first diagnosed in coma, and coma is still the most important cause of death in diabetic children. In our series of twenty-five children, coma has been encountered twenty-seven times. It is necessary to define just what is meant by coma. In some clinics a CO_2 -combining power of twenty or less is regarded as coma—a purely arbitrary figure chosen because in the pre-insulin era the mortality in such cases was exactly 100%. In our clinic, because we had no access to CO_2 -readings, a clinical standard was set up and any diabetic child showing drowsiness, hyperpnoea and ketonuria was regarded as a case of coma. As a matter of fact, only about one-third of the coma cases were actually completely unconscious.

The clinical picture of diabetic coma is too well known to all of you to warrant detailed description here. The success in treatment of this condition depends upon its being handled as a medical emergency. Absolute co-operation between the doctor, the house physician and the nursing staff is essential to a successful termination of the case.

I say house physician, and not house physicians advisedly. I believe that it is the duty of the interne who first sees the case to look after the case himself until the patient is out of coma.

The man who starts the treatment is the one best able to judge whether the patient is responding satisfactorily to treatment or not. In a condition where insulin dosage and the administration of fluids must be varied from hour to hour, it is disastrous to have the case handled by two or three different internes.

As soon as the patient is brought into the hospital and the diagnosis made, insulin is administered at once. The dosage depends entirely on the patient's condition and varies anywhere from 20 to 40 units subcutaneously. We have given insulin intravenously on one or two occasions, but have discontinued this method of administration. The patient's bladder is emptied either voluntarily or by catheterization. It is important to start working with the bladder empty for a reason which will become obvious in a few minutes. The patient has a gastric lavage with 2% sod. bicarb. This is a procedure which we now carry out routinely in every case on administration, unless the degree of acidosis is very mild. We feel that if gastric lavage is not done early it will be done late. Lavage removes any food present in the stomach and very often enables the patient to take fluids by mouth thereafter, without vomiting. There is, however, a much more important angle to it. One of the commonest symptoms complained of by a patient in severe diabetic coma, is abdominal pain, often of an excruciating nature. The cause of this pain has never been definitely determined, but there are some people who think it is due to acute dilatation of the stomach—a part of a general intestinal ileus occurring in a coma. It is very possible that the occasional case of death in diabetic coma is due to acute dilatation of the stomach. At any rate the pain is very often promptly relieved by lavage, vomiting stops, and fluids can be given by mouth. If lavage is delayed, the patient may take fluids for a while, then vomiting sets in, treatment has to be interrupted for a gastric lavage, and valuable time has been lost.

An enema is then given, also routinely. This clears out the lower bowel and enables us to give a stimulant in the form of three to four ounces of warm black coffee as a retention enema. We make no effort to give fluids by bowel.

Blood pressure is taken and checked periodically. This is of a great deal of importance and a blood pressure, within normal limits, is a very valuable indication that the patient is coming along satisfactorily. Conversely, a falling blood pressure is a sign of very serious significance, since with a falling blood pressure, kidney function is impaired and one of the main avenues of excretion of ketone bodies is closed.

The above-mentioned procedures take up about twenty minutes; they can be done without fuss and without hurry and rarely have to be repeated.

From then on treatment is a matter of:

1. Supplying fluids to combat dehydration.
2. Giving insulin to overcome the acidosis.

3. Supplying warmth and vascular stimulation.

Fluids are given by mouth whenever possible and, very often it is possible. Bovril, salted broth, 5% glucose drinks, ginger ale, water, are all given in sips at first, and gradually increased. The nurse must be wide awake enough to see that the patient is offered fluids every 10 to 15 minutes. Glucose is not forced or given in any definite quantity. My feeling is, that there is already an abundance of sugar in the blood and it requires only sufficient insulin and an improved circulation to render it available. No attempt is made to cover insulin with glucose, so long as there is marked sugar in the urine. When the sugar begins to disappear in the urine, fluid carbohydrate, in the form of orange juice, glucose drinks, or ginger ale, are given to the amount of 100 gms. in twenty-four hours. We *do* measure the amount of fluid taken, to be sure that sufficient fluids are given. In addition to giving fluids by mouth, an intravenous of normal saline is often given at the outset, in a case of moderate severity. The solution must be allowed to run in very slowly. Occasionally, we have used the continuous intravenous method, allowing solution to run in very slowly over the course of about twelve hours.

Insulin is, of course, an extremely important factor in treatment. We can give no rules as to the quantity of insulin given or the frequency with which it should be given. Our cases take, on an average, 100 to 150 units in the first twenty-four hours. We have had cases come out of coma with 50 units, and we have used 200 units. The dosage is determined as the result of urinalysis and clinical observation. As I pointed out earlier, treatment starts with an empty bladder. Thereafter, every dose of insulin is preceded by a urinalysis for sugar, diacetic acid and acetone. As long as sugar is present in the urine, it is safe to give insulin. If sugar disappears from the urine before the patient is out of coma, then glucose must be given by every available route until sugar reappears in the urine.

Insulin is given every hour or every two hours until the urine tests show that the sugar is decreasing. Then, we follow Joslin's scheme of giving 20 units for a red test, 15 units for a yellow test, 10 units for a green test, and no insulin, of course, for a negative test. Insulin at this time is given every four hours.

There may be some here, who will disagree with some of the details of treatment of coma in children, as carried out in this clinic. It is only necessary for me to say that since the clinic was organized in 1930, there has been not one single death in a diabetic in the Children's Hospital.

Complications of Coma.

I have had some interesting experiences in our coma cases, but I propose to refer to only two of these.

ABDOMINAL SYMPTOMS OF DIABETIC COMA

One of the most interesting, as well as one of the most puzzling conditions met with in diabetic acidosis, is the so-called diabetic abdomen. This condition has been encountered on several occasions, and is far more common than is generally realized.

CASE 1. A girl of eleven who had had Diabetes for two years, was perfectly well on Sunday. On Monday, she felt poorly and vomited her breakfast; she stayed in bed and felt somewhat better. Tuesday morning she vomited again, had some difficulty in breathing, and began to experience severe right-sided abdominal pain. She was admitted to the Children's Hospital. Examined by the interne, she revealed a picture of moderate acidosis, a rigid right abdomen, and marked tenderness over the whole right side of the abdomen. The interne's diagnosis was Diabetic acidosis, due to either acute appendicitis or lobar pneumonia involving the right lung base. Leucocyte count was 30,500. Temperature was 102 degrees. Urine was loaded with sugar, diacetic acid and acetone. Gastric lavage was done, and 40 units of insulin given, along with glucose and intravenous fluids. When she was seen four hours later, she was bright, had no pain, and the abdomen was completely relaxed.

CASE 2. A girl of 13, a known diabetic, was brought into the Children's Hospital, with entrance complaints of drowsiness, severe right-sided abdominal pain, and vomiting. Examination showed a girl in moderate acidosis, drowsy but easily roused. The right side of the abdomen was rigid and very tender on pressure. The abdomen was distended and it was thought that the apex beat of the heart was displaced upwards and to the left. The leucocyte count was 30,000. Temperature 101 degrees. Pulse 140. Urine loaded with sugar, diacetic acid and acetone. Gastric lavage was done, insulin and fluids given, and she improved rapidly. Twelve hours later, she was fully conscious, free of pain and had a leucocyte count of 9,800.

These two cases serve as examples. Usually there is no difficulty in diagnosis, since the acidosis overshadows all other symptoms. Sometimes, however, the abdominal symptoms form the prominent part of the picture and diagnosis may be extremely difficult. The leucocyte count is more often a hindrance than a help, since our experience is that it is always elevated in diabetic acidosis sometimes as high as 50,000 or 60,000. When one realizes that it is perfectly possible for a diabetic to have an attack of acute appendicitis and develop acidosis as a result, the importance of caution in the making of a diagnosis becomes evident, operation is not to be considered lightly in a patient already in acidosis. I believe it is safe to treat these patients for four hours as simple cases of acidosis, as in my experience, the abdominal symptoms have usually cleared within four hours of the commencement of treatment. The diabetic who has acute appendicitis usually presents pain as the first symptom,

rather than vomiting, and the tenderness is usually definitely localized. Rectal examination may be very valuable in differentiating. If the abdominal symptoms persist after four hours of intensive treatment with insulin and fluids, laparotomy should be done. I feel there would be nothing lost by the delay since the patient, in any case, would be a much better operative risk with the acidosis controlled.

The cause of the abdominal symptoms in diabetic acidosis has never been satisfactorily explained. Three theories have been put forward:

1. That it is due to an inflammatory process in the pancreas.
2. That it is an acute diabetic neuritis.
3. That it is due to acute dilatation of the stomach.

I am inclined to favor the last of these theories. A generalized intestinal ileus of greater or less degree seems to occur in every case of coma that I have seen. Enemas are necessary to empty the bowel and abdominal distension is frequent. There is frequently prompt relief following a gastric lavage and the quantity of brownish fluid present in the stomach in these cases, is often surprising.

Anuria.

Anuria is a dreaded complication occasionally met with during the course of treatment of a case of diabetic coma. We have seen it on two occasions.

CASE 1. A girl of 12 was admitted in coma on November 25, 1932. She presented the typical picture of diabetic coma with Kussmaul respirations, soft eyeballs, etc. Sugar, diacetic acid and acetone were present in the urine in large amounts, and micro-urinalysis also showed many granular casts (a not uncommon finding in diabetic coma). Leucocyte count was 61,000. The girl's condition was very poor. An intravenous of 5% Glucose in saline was given and insulin was given intravenously, at 11 a.m. Insulin was repeated at hourly intervals and then at two-hourly intervals, and she seemed to improve during the afternoon and even took fluids by mouth. In the early evening, the interne (who, by the way, had been on duty on the case from the time of admission), noticed a change in the patient's condition. The girl was in deep coma but her breathing was shallow and she could no longer be roused to take fluids. In addition, he noticed that he was obtaining very little urine by catheterization and, in fact, none from 7 p.m. on. I saw her at 10 p.m. Blood sugar and blood urea were taken for scientific purposes and a continuous intravenous of 10% glucose started. Shortly thereafter, urine began to appear again, and by morning, she was conscious and voiding normally. The laboratory, the next morning, reported a blood sugar of 177 mgms. and a blood urea of 164 mgms. per 100 ccs.

CASE 2. A child of four, admitted in diabetic coma on February 15, 1934, at 9 p.m. Intensive

treatment was started, and by next morning she was conscious and taking fluids readily by mouth. At 6 p.m. she was bright, talking to her mother, and seemed quite well. The next day she lapsed into coma, although, the clinical picture was not that of diabetic coma. Her respirations were shallow, pupils contracted, and she could not be roused. Catheterization produced about two drams of urine containing no sugar, but containing acetone and diacetic acid. Blood urea was taken. An intravenous of 50 ccs. of 25% Glucose was given. Diuresis followed soon after, and the patient made a complete recovery. The blood urea report was 100 mgms. per 100 ccs.

The exact cause of anuria in diabetic coma has not been satisfactorily explained. The following factors have been suggested:

1. Circulatory disturbance in the kidney, accompanying a decrease of blood pressure and cardiac failure.
2. Dehydration of blood plasma as the result of lack of intake of fluid, polyuria and vomiting.
3. Acute pathologic change in the renal parenchyma, as a result of an excessive excretion of ketone acids in the early stage of coma.

Success in the treatment of this dangerous complication depends on early diagnosis and prompt treatment with hypertonic solutions of either saline or glucose—both methods having been used with success.

Blood Sugars.

You may have noticed that no reference was made to the taking of an emergency blood sugar on admission. We have tried to treat our cases of coma without the assistance of blood sugars. Originally, this was done for the purpose of teaching internes to treat these cases as they might to treat them in general practice away from a hospital. We found that we could usually get along very well without a blood sugar report. After all, a blood sugar taken on a patient coming in in coma can only do two things: it can make the diagnosis, and it can satisfy one's curiosity. In over 95% of the cases, the diagnosis can be made readily on history, physical examination, and urinalysis and usually is made before ever a blood sugar is taken. From the patient's point of view, the satisfying of the doctor's curiosity is an expensive procedure. It makes very little difference whether the blood sugar is 300 mgms. or 500 mgms., and, in any case, a laboratory report showing that the blood sugar is 300 mgms. only means that it *was* 300 mgms. at the moment the blood was drawn. An hour may have elapsed in the interval, insulin given, glucose and fluids given, gastric lavage and enema done, so that the blood sugar report is of very little value. Blood sugars are sometimes taken a little later on in treatment when the urine is clearing and there is some doubt as to whether it is safe to give more insulin or not. Then the blood sugar

is of more definite value and may be justified. To take the place of the blood sugar, the urine is used as a guide. The treatment of a case of diabetic coma is started with an empty bladder. Every dose of insulin is preceded by a urinalysis for sugar diacetic acid, and acetone. So long as sugar is present in the urine, one can safely assume that the blood sugar is over 160 mgms. and insulin can be given with safety. As the urine tests show less and less sugar, insulin is given less often, and in smaller doses.

The management of a case of Diabetes calls for a consideration of three factors:

1. Diet.
2. Insulin.
3. Exercise.

Diet: A great deal has been written about diet and diabetes, and about a dozen different types of diet have been used in the treatment of Diabetes. We shall concern ourselves with only four.

1. The high fat diet of Newbergh and Marsh.
2. The high carbohydrate: low calorie diet, as used by Sansum, Geyelin, Rabino-witch.
3. The free diet.
4. The normal type of diet.

The High Fat Diet was particularly popular in the pre-insulin era, and served a definite and valuable purpose. It is, however, particularly unsuited to children. It is unpalatable. It is not the type of diet the other members of the family are having, so that the diabetic child is continually being reminded of his disease. The large percentage of fat and the correspondingly low percentage of carbohydrate, makes the child a candidate for acidosis everytime he develops an acute infection. It is a diet which leads a child into temptation and disorganizes diabetic management. Normal growth is the exception rather than the rule.

The High Carbohydrate—Low fat diet, we feel, is just as wrong as the high fat diet. It is not a normal type of diet and the restriction of fat deprives the patient of some foods which he likes. Unless the fat is kept at a very low level, excessive gain in weight will occur, and we have found it impossible to control glycosuria in this diet.

The Free Diet is mentioned, only to be condemned. A diabetic on a free diet is an uncontrolled diabetic. He dispenses first with his scales, then with his urine tests, usually with his doctor, finally with his life. The result is recurrent acidosis and the development of all the dreaded complications of the disease. Training and discipline are important features of management of a diabetic child. With a free diet there is no place for either.

The Normal Type of Diet is the diet we favor. Its advantages can be summarized:

1. The diabetic's diet is the same as the diet of the rest of the family, and therefore it is less expensive.

2. It is a palatable diet.
3. The child can have every food he likes included in the diet.
4. It allows for normal growth and full activity.
5. It furnishes a measure of protection against acidosis.

Our aim has been to give the child a diet which will be satisfactory to him and to us, which will allow him to attend school full time and take part in all the activities in which he is interested; which will allow him to grow normally in height and weight, so that he cannot be picked out of a group of his playmates and labelled a diabetic, and which will not impose upon his mother the added burden of preparing two separate menus for her family. The normal type of diet has filled all these expectations, and we have had no desire to change it. Each diet must be adjusted to each individual child and there are no text-book formulae which will tell you how much carbohydrate, protein, and fat a child requires. The children in this series are on diets ranging from 100-165 gms. Carbohydrate, 60-75 of Protein, 70-90 of Fat.

Insulin: Of the use of insulin I need say only that it is used in sufficient quantity to enable a child to take the diet he requires for normal growth and full activity, and not excrete more than 25 gms. of sugar in the urine per day. Every childhood diabetic requires insulin. If insulin is withheld either because of the parent's obstinacy or the doctor's desire to get along without it, the child must necessarily be kept on a restricted diet which will interfere with growth and nutrition, or if he is kept on a full diet, his disease will progress to a fatal termination. The benefits of insulin have not been fully realized by the medical profession, and there still are men who use insulin only to rescue patients out of coma, and then pride themselves on getting along without it. Insulin is available and it should be used to full advantage. Some of our children use 3-4 units a day, others use as much as 60-70 units a day. Most of these take two injections a day, some take three, and one takes four. Three children are now taking Protamin-Zinc-Insulin instead of the old insulin. These cases have not been studied long enough to be included in this report.

Exercise is very important in the management of the childhood diabetic. Exercise tends to lower the blood sugar of a well-treated diabetic. Children in Diabetic summer camps get along on less insulin than they require during the winter, when exercise is necessarily restricted. We encourage these children to take part in all activities: Hockey, skating, football, and so on.

CONCLUSION

Our purpose in establishing the clinic was not to collect a great mass of statistics or to attempt to revolutionize the treatment of Diabetes. We hoped, by co-ordinated effort, to study the disease with particular emphasis on the management of the child outside the hospital. We felt

that it was possible for these children to lead normal, happy lives; that home management could be simplified by proper education and follow-up; that the disasters of diabetic coma and continuous hospitalization could be avoided by properly organized teaching, and the creating of a sense of responsibility in the mind of the child and its parents. Finally, we hoped in the course of time, to be able to give the lie to those who felt that a diabetic child was better off dead. There are many in the medical profession today who look upon a diabetic child with mingled feelings of pity and pessimism, for which, I believe, there is no justification. Diabetes of childhood has gone through three eras—the era of complete hopelessness, which prevailed prior to 1922, when a diagnosis was a seal of doom and when a man like Van Noorden was able to say:

“If a true diabetic disposition develops in a child, it progresses relentlessly, however slight it may be at first, and even when the treatment is the best in the world. Infantile diabetes knows no mercy; one can, at most, only defer the end for a little time.”

—Van Noorden, 1905.

Then the opening of the insulin era, when it became possible for a diabetic child to live and be kept alive, but on diets so inadequate, and on doses of insulin so small, that life seemed hardly worth while. And, finally, the present era, when, with the aid of sufficient insulin, normal diets and proper management of the disease, the diabetic child found it possible not only to live, but to enjoy life in a measure often denied to his more fortunate non-diabetic playmate.

*Tuberculosis in Northern Manitoba

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The care of tubercular patients is the most important problem in public health administration, because the death rate from tuberculosis is higher than from all other infectious diseases combined. Patients who are ill with tuberculosis are ill a long time, and if they recover the recovery is often only partial, a condition of chronic invalidism and incapacity being the final result of years spent in taking the cure. The cost of tuberculosis clinics, sanatorium beds, public health nursing, etc.—the shock troops in the war against tuberculosis—is a staggering amount. In this Province of 731,000 people this front line warfare is carried on at a cost of \$500,000 a year.

This amount of five hundred thousand dollars a year is a very conservative estimate of the actual amount expended in the care of tuberculosis people

in this Province. For example, last year the Ninette Sanatorium and the Central Tuberculosis Clinic combined spent about two hundred and thirty thousand dollars; the St. Vital Sanatorium about the same amount, perhaps a little less. In addition to this, there was a very considerable number of tuberculosis patients looked after in the King Edward Hospital, Winnipeg. Besides this, in every hospital in the Province there are cases of tuberculosis being maintained at public expense, some of them temporarily while waiting for admission to the Sanatorium and others with various forms of tuberculosis which may be treated more advantageously in a general hospital than in a sanatorium. Then the Public Health Nursing service devotes a considerable part of its activities to the care of tubercular patients outside of institutions. From these facts it is very obvious that the cost of looking after the tubercular in Manitoba is considerably above the figure mentioned.

It is interesting further to note that the per capita ward cost of patients in public wards throughout the Province last year was \$2.30 per day, of which 60c per day was spent for the care of the tuberculous, while in Unorganized Territory, which is situated almost entirely in the northern part of the Province, the cost for tuberculosis amounted to \$1.17 per day, just about double what the actual cost was in the southern part of the Province, indicating the intense segregation of the tuberculous in northern Manitoba; in other words, the percentage of cost for looking after tuberculous patients in the organized portion of Manitoba was 27% of the whole, while the cost in Northern Manitoba was 42% of the total cost.

In addition to this the wives and families of these patients are usually supported from public funds, and who is prepared to estimate how much the community loses through the impaired activities of discharged tubercular patients? The taxpayer is usually called upon to foot almost the entire bill. During a three year period in a large local sanatorium less than 1% of the patients paid cost for services rendered, and less than 3% made any direct financial contribution to the institution.

The people of this province have been educated to the point where they have given generously to carry on a campaign having for its objective the complete control of tuberculosis within a short time, but this objective is not being reached as expeditiously as was hoped. We find that in the race for a low death rate Manitoba and British Columbia are being outdistanced by the other western provinces—even by Ontario—while seven States immediately adjoining us and south of the International Boundary, have a yearly death rate 43% less than ours.

Tuberculosis Mortality Rates per 100,000 For the Year 1934

Prince Edward Island	104
Nova Scotia	88
New Brunswick	66

* Read at the Annual Meeting of the Manitoba Medical Association at Winnipeg, May, 1936.

Quebec	88
Ontario	37
MANITOBA	53
Saskatchewan	30
Alberta	40
British Columbia	78

A study of mortality rates as affected by racial groups points very clearly to one of the causes for our poor showing in the contest. We have in Manitoba a larger Indian population than any other western province, except British Columbia. Roughly 2% of our total estimated population of 731,000 is composed of Indians, and this 2% contributed 28% of all the deaths from tuberculosis in Manitoba in 1934: To be precise, there were 113 deaths among 15,000 Indians—a rate of 753 per 100,000—while among 716,000 others of the population there were 282 deaths, a rate of 39 per 100,000!

The geography, and especially the climate of any country, is often a very important factor in determining the living conditions of the inhabitants, so in order to get a clear understanding of public health problems in Manitoba it is necessary to review briefly the geography and climatic conditions of the Province.

Manitoba is the only one of the three prairie provinces that has direct access to salt water. Churchill, at the mouth of the Churchill River, has an excellent harbor opening into Hudson Bay, but navigation is closed by ice for eight or nine months out of the year, and although Churchill is on the same parallel of latitude as the northern part of Scotland, 58° north in one case means nine months winter, and in the other, harbors open twelve months in the year.

The entire province of Manitoba is drained by rivers which flow into Hudson Bay, and since there is a gradual slope of land northward, and no intervening mountain range, cold north and west winds prevail. The rainfall, while not abundant, is usually sufficient for the growth of hard grains and the soil in the south and western prairie sections is excellent. All of north eastern Manitoba, probably five-sixths of the whole province, is part of a gigantic peneplain, which extends from Labrador to the Rocky Mountains. The country rock is almost entirely igneous: granite and gneiss, etc. In consequence the soil is acid, the forests are predominantly coniferous, sparse, and usually stunted, especially towards the northern sea.

The landscape of northern Manitoba owes its characteristic features to intense and repeated glacial erosion. Thousands upon thousands of lakes are scattered broadcast among the granite hills and primitive rocky ledges which slope down to Hudson Bay. Many rivers, all flowing north and east, carry on the work of wearing down the old Laurentian Highland and transporting its sediment into the shallow southern end of the Great Bay of the North. Scattered throughout this vast region of lakes, rivers and dark forests of pine and spruce is a meagre population of not more than twenty thousand souls. Half of these are Indians, with the balance largely composed

of miners, prospectors, white trappers, and traders, and a small number of employees of the Hudson Bay Company. The Indians are Wood Crees, an offshoot of the Great Ojibway stock. Dr. J. C. B. Grant, now Professor of Anatomy in the University of Toronto, a few years ago spent a summer among these Indians, measuring and studying their anatomical peculiarities, with a view to determining their affinities, either to the Indians of the North Pacific Coast or to the Plains Indians to the south. I believe it was Doctor Grant's opinion that the Wood Crees had come from the south, rather than from the west, and probably they were driven down the Arctic slope by the more vigorous tribes of the Great Central Plain. The Crees did not trek into this wilderness of lakes, sparse vegetation and turbulent rivers flowing through granite gorges, because they were drawn by the urge of a pioneer to enter a promised land; rather they fled north to escape the arrows and spears of the mounted Mandans and Sioux. The Crees live in winter in log shacks, the logs chinked with moss. The roof is also of chinked logs covered with earth. There may be a window and an ill fitting door. There never is a floor. Into this wretched hovel a hunter and his family, composed of children, nondescript adults, and dogs, huddle together through the long winter nights. The head of the family is out following his line of traps, sometimes not returning to his hut for a week. The physical strain these unfortunates must endure can only be realized by one who has personal knowledge of the facts.

The treatment of tuberculosis is not satisfactory because its etiology is still obscure; its immediate cause—infection by the bacillus tuberculosis—is of course a matter of common knowledge, but the tuberculosis bacilli is only the seed which requires a fertile soil in which to germinate, and what is a fertile soil?

In many areas, both urban and rural, in North America, there are consumptive centres, where both mortality and morbidity rates are inordinately high. What are the common factors in living conditions in these infected areas? Evidently bad hygienic surroundings, crowding, poor ventilation, whether in isolated Indian shacks on the shores of Hudson Bay or in a crowded tenement in New York. Improper and insufficient food. This applies particularly to the Indian population of the Northwest. Fish is their staple food, mainly whitefish in summer. The fish is netted, cleaned and dried in the sun, then ground up into a kind of pemmican, and kept in reserve for times of scarcity. Many Indian families live almost exclusively on fish, but if the fur crop is profitable a little flour and tea is obtained from white traders. No vegetable food is used, although in the month of August, 1931, the writer found fourteen varieties of wild fruit ripening and in great abundance at latitude 57 north! It is a curious, perhaps an illuminating fact, that the Esquimaux who live north of 60, and who live on an exclusive diet of sea fish and seal meat, are practically exempt from tuber-

culosis. May we not logically assume that a diet of fresh water fish lacks some essential element which is found in the flesh of fish caught in salt water? After living for a prolonged period—a month or more—on fish, the Indians become greatly emaciated and most of them suffer from diarrhoea; then certainly the soil is well prepared to produce an abundant harvest of consumptive patients.

The Indians of the North-west are handicapped against tuberculosis because of:

- (a) Poor heredity,
- (b) Inhospitable climate,
- (c) Bad hygiene,
- (d) Improper food.

What can be done about it?

The stock is not being improved by intermarriage with the class of whites who condescend to such alliances. Neither does marriage with the halfbreed population serve to introduce a more resistant strain, as shown by the fact that the tuberculosis death rates are even higher among halfbreeds than among Indians.

There is not much that can be done to remove the climatic or environmental handicaps of the northern Indian. For years the Federal Government of Canada has maintained a considerable number of boarding and industrial schools where Indian boys and girls receive an elementary academic education. They are also taught domestic science, and are given besides a course in farming and certain trades. If these boys and girls would remain down where the land is arable and the seasons suited to the growth of cereals and live stock, much good might be accomplished. "But" and "if" are the most significant words in the English tongue. An Indian youth has a background of a hundred generations of hunting, fishing, and loafing in the sunshine, and who could expect to uproot traditions of a race of such great antiquity in a few short months of intensive training? The writer has spent several summers in the north visiting remote trading posts, travelling by canoe, following the maze of lakes and rivers that extend from Lake Winnipeg to the Bay. Game is scarce, forest fires and wasteful methods of hunting and trapping have almost exterminated the beaver, and with the beaver has gone at the same rate the less valuable fur-bearers, so the Indians' occupation has vanished with the beaver. He, perforce, must live anyhow or somehow, and now he camps in the neighborhood of the white man's trading posts, mining camps or fishing stations. He lived precariously even at the best; now there is no best, nor hope of it, for the aborigine. There seems to be but one ray of hope; fur farms are now producing a considerable fraction of the world's supply of fur. Why should Indians not be taught how to farm foxes, beaver, mink and muskrat, instead of striving vainly to make of them bankrupt dirt farmers?

Volumes might be written about the history of tuberculosis on this continent. Did the Pale-

face infect his Red brother with the deadly bacillus of tuberculosis as well as the potent treponoma pallida, or were the North American Indians subject to tuberculosis previous to the coming of the whiteman? In 1633, only 25 years after Champlain founded the Colony of Quebec, Le Jeune, a Jesuit missionary, found that nearly all the young Indians had scrofula, and less than forty years later Jessel found that among the Indians of New England consumption was extremely common. Nevertheless it is quite possible that tuberculosis was introduced from Europe after 1492, and spread like wild fire among the non-immune natives of the western world. According to Dr. George Ferguson of Saskatchewan, who has studied the history of tuberculosis as affecting Indians of the western prairies, there is little or no evidence of the existence of the dread disease among the Indians of Saskatchewan prior to 1870, but by 1884 the infection had become an epidemic of the most lethal character. Since then the virus has become less potent, or the soil less fertile, until now the mortality rate in Saskatchewan is considerably lower than it is among the Indians of Northern Manitoba. The Indians of Saskatchewan are of a more vigorous stock than those who inhabit the wooded area to the north-east, and would in consequence develop more rapid resistance to infection.

Reference has already been made to certain Boarding or Industrial Schools which our Federal Government maintains for the education of Treaty Indians. Doctor Meltzer, of the staff of Ninette Sanatorium, has recently completed a survey of health conditions in six of these "Indian" Schools. Five hundred and twenty-seven children between the ages of two and twenty were Tuberculin tested, had chest plates made, and were subjected to physical examination. A second group of three hundred and forty-six white children attending school, and known to have contact with active cases of pulmonary tuberculosis was examined, and finally a group of three hundred and ninety-one unselected white children were subjected to the same series of tests, and a comparison made of the findings in the three groups:

- 1st—527 Indians at school
- 2nd—346 white children, known contacts
- 3rd—391 white children, unselected

Many interesting points of comparison were demonstrated by a tabulation of the results obtained, but just a few of such contrasts may be referred to here.

(a) Tuberculin Reaction:

Group 1—440 out of 527 Indians reacted	84%
Group 2—189 out of 341 whites reacted	56%
Group 3—65 out of 391 whites (unselected) reacted	16%

(b) Clinical x-ray evidence of Tuberculosis:

Group 1—Some evidence of Tuberculosis infection	72%
Group 2—Some evidence of Tuberculosis infection ..	39%
Group 3—Some evidence of Tuberculosis infection	11%

Among other suggestive facts disclosed by Doctor Meltzer's survey may be mentioned the finding that in schools on the reservations—where the pupils are in more or less intimate

contact with their parents—direct evidence of tubercular infection was at least twice as frequent as it was in children at schools where schools were centrally located and a long distance from Reservations, hence few opportunities for contact and infection. This fact also indicates that the Indian children of non-resistant stock react very favorably to good food, warm clothing and the excellent general care which they receive in Government Schools.

The crux of the situation seems to be this: The Province is doing a great deal in the way of providing hospital care and public health and welfare services for its white population, while a steady stream of infection from the North filters through the fringe of metis or half-breeds which lies between white and Indian areas, and as long as no attempt is made to control this infection at its source, little improvement can be expected. The Hudson Bay Company employees, traders, trappers, and explorers of many European peoples have for several centuries intermarried with the Indian women, and have left a numerous progeny of half-breed children, many of whom, when they reach adult life, become Indians in all but color, and live by trapping and fishing. Some of these hybrids, however, settle down as farmers and traders, and are gradually assimilated into the Caucasian races. Along the great rivers of the North—the Saskatchewan, the Red and the Assiniboine—settlements of natives (whites and half-breeds) have existed for many years. These half-breed communities have been a sort of genetic halfway house between the two races—white and red—and through this medium the white man and the red have interchanged infections as well as other commodities, desirable and otherwise. As a consequence these half-breed settlements are probably more heavily infected with tuberculosis than even the Indians of the North.

The situation with regard to tuberculosis is almost as bad in certain sections of the half breed population as it is amongst the Indians. For example, a survey was made in 1932, of a small municipality with a population of 520. One hundred and eighty-seven applicants were examined, of which number 26 were found to have active infection. Of these 26 patients, ten were admitted to a sanatorium at once, and within the next few months six more, making sixteen cases of active disease that require prolonged institutional care. This means an actual expenditure of over \$10,000.00 a year.

There are doubtless many other sections of northern Manitoba where almost parallel conditions exist; and it is evident, if the Province undertook to hospitalize all of this class of patients, who need institutional care, the cost would be far beyond the resources of the taxpayers at present. There must be some alternative way of dealing with this particular angle of the problem. Something in the way of a Public Health Nursing Service, such as has been established in Western New York State under the

Millbank Memorial Fund. The writer visited Cattaraugus County in 1928, and believes that the type of service established there in a rural community might, with modification, be adapted to our own Province.

The logical way to solve the problem of high death rates from tuberculosis in this province is evident. Stop the spread of infection from the North. But how? There were 113 deaths (from tuberculosis) among 15,000 Indians in 1934. 113 deaths per annum in a white population would mean, by New Haven standards, at least 400 people sick with tuberculosis. In an Indian population it would mean more than 400 ill and requiring care. Frankly speaking no government—however altruistic in sentiment it might be—could spend the taxpayers' money at the rate of \$800 per day in looking after tuberculous Indians, when all Indians, sick and well, number only about 2% of our total population. So a bed for every Indian sick with tuberculosis is a fantasy, a will-o-the-wisp, and not within the range of possibility.

Must we then admit defeat? Must we go on and on trying to cure our tuberculous whites and watching the deadly flood of infection pouring down from the North year after year? The day that Columbus touched American soil saw the Doomsday Book of the American Indian opened to record his fate. Ravaged by war, driven into the waste places of the desert and the Arctic barrens, decimated by pestilence, and harrowed by unspeakable poverty, is it not both a duty and a privilege of the conquering white man to make what amends he can for five centuries of injustice to the 100% American?

Tuberculosis is more than an infectious disease. It is a challenge to civilization, the answer to which is a world at war. The fighting units include not only laboratories, clinics and sanatorium beds, but also huge provincial and municipal budgets to defray costs. The problems demanding solution are most intricate—involving factors of social and political responsibility, factors which touch the thoughts and the pocket-books of every citizen of Canada.

The purpose of this paper is to demonstrate the unique situation which exists affecting the control of tuberculosis in Manitoba. The various factors which contribute to the unusual prevalence of the disease among our Indian population are reviewed. The channels through which the infection filters into the white population are outlined, and some—unfortunately a very few—suggestions are made as to how conditions might be improved. The writer feels that present methods of control of tuberculosis among the whites are, for various reasons, not feasible nor adequate when applied to the northern Indians, and he is looking for more light on a problem, the answer to which up to the present moment is clouded with uncertainty.

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MINUTES OF SPECIAL EXECUTIVE MEETING

September 25, 1936.

Minutes of a Special Meeting of the Winnipeg Members of the Executive of the Manitoba Medical Association, held in the Medical Arts Club Rooms on Friday, September 25th, 1936, at 12.30 noon.

Present.

Dr. J. D. Adamson (Chairman), Dr. C. W. Burns, Dr. F. W. Jackson, Dr. P. H. T. Thorlakson, Dr. S. G. Herbert, Dr. W. G. Campbell, Dr. F. G. McGuinness, Dr. E. S. Moorhead.

Guests.

Dr. T. C. Routley (Toronto), Dr. J. C. McMillan, Dr. Ross Mitchell, Dr. J. D. McQueen, Dr. W. Harvey Smith, Dr. C. W. MacCharles.

A special meeting was called to meet Dr. T. C. Routley, Secretary of the Canadian Medical Association, who was on his way through to the east.

Dr. Routley reported on the two provincial meetings in Alberta and Saskatchewan, and gave a review of the negotiations of various provincial associations in reference to Federation to date.

Discussion took place as to the advisability of calling the representatives from all the provinces together at some central point to go into the matter of Federation in detail, as this suggestion had been made at the Annual Meeting of the Canadian Medical Association in Victoria. However, it was pointed out by Dr. E. S. Moorhead the understanding of this association was that each association would appoint its own committee on Federation, one of the members on this Committee being the Provincial representative on the Canadian Medical Association Executive and that at the Executive Meeting of the Canadian Medical Association all the provincial representatives should get together and bring forward the deliberations of each provincial committee in order that the differences of opinion and difficulties might be considered and ultimately ironed out. It was thought possibly at some later date after the main points had been discussed and clarified by the provincial members on the executive that it might be advisable for the whole Committee to meet.

The meeting adjourned at 2.15 p.m.

MINUTES OF EXECUTIVE MEETING

October 22, 1936.

MINUTES of a Meeting of the Executive of the Manitoba Medical Association held in the Medical Arts Club Rooms on Thursday, October 22nd, 1936, at 6.30 p.m.

Present.

Dr. Geo. Clingan	Dr. W. S. Peters
(Chairman)	Dr. J. D. Adamson
Dr. F. W. Jackson	Dr. F. G. McGuinness
Dr. P. H. T. Thorlakson	Dr. E. K. Cunningham
Dr. S. Bardal	Dr. R. E. Dicks
Dr. S. G. Herbert	Dr. W. E. R. Coad
Dr. E. S. Moorhead	Dr. W. G. Campbell
Dr. O. C. Trainor	

Following luncheon, the President called the meeting to order and the Secretary read the minutes of the last Executive Meeting held on September 18th, also minutes of a special meeting of the Winnipeg members held on September 25th, and after being duly moved and seconded these minutes were approved by the Executive.

The Secretary reviewed the business arising out of the minutes and advised that Dr. Strong's letter had been turned over to the Winnipeg members of the Executive, but a meeting to deal with same had not yet been held: Dr. James McKenty's report was referred back to the Winnipeg Medical Society asking if there was any further disposition of the matter that they might wish us to make: Dr. Cairn's letter had been forwarded to Dr. T. C. Routley in Toronto, and acknowledgment of same had been received from his office.

APPOINTMENT OF COMMITTEES.

It was duly moved and seconded that the following be appointed Chairmen of Committees as listed below:

Legislative Committee.

Dr. G. S. Fahrni.

Radio Committee.

Dr. R. W. Richardson.

Committee on Historical Medicine and Necrology.

Dr. Ross B. Mitchell.

Committee on Maternal Mortality.

Dr. J. D. McQueen.

Editorial Committee.

Dr. C. W. MacCharles.

Editorial Board of C.M.A. Journal.

Dr. Ross B. Mitchell
Dr. E. S. Moorhead
Dr. C. W. MacCharles.

Committee on Sociology.

Dr. E. S. Moorhead.

Workmen's Compensation Referee Board.

Dr. W. Chestnut.

Representative to Manitoba Sanatorium Board.

Dr. F. A. Benner.

Auditors.

Dr. F. G. McGuinness
Dr. S. G. Herbert.

MEETING OF UNITED FARMERS OF MANITOBA.

It was reported that Dr. C. R. Rice had been requested by the United Farmers of Manitoba, through the College of Physicians and Surgeons, to address a meeting of that body to be held at Neepawa within the next week. Dr. Rice was asking permission from the Executive if he could extend to them an invitation to have a speaker from their body address the doctors at a future meeting of this Association. Discussion followed by Drs. Peters, Adamson and Clingan, and it was felt that we should ask the United Farmers to provide a speaker, preferably for some luncheon and possibly at next Annual Meeting. This would tend to make a better understanding between the profession and the United Farmers.

It was moved by Dr. J. D. Adamson, seconded by Dr. W. S. Peters: That Dr. Rice be authorized to extend a formal invitation to the United Farmers of Manitoba to provide a speaker at our next Annual Meeting.

The Secretary was instructed to forward an official letter to them in this regard. —Carried.

RE. TRAINING SCHOOLS FOR NURSES.

The Secretary advised that the President of the University desired information regarding training schools for nurses, and in order to get definite data he had prepared a questionnaire, which, it was suggested, should be forwarded to all doctors throughout the province who are practising in points outside of the hospital areas.

Discussion followed. Dr. Thorlakson stated he did not think the information obtained by such a questionnaire would be of any advantage. Dr. Jackson explained the facts leading up to this and that the Nurses Association were claiming that nurses trained in small hospitals were not of equal value with nurses trained in larger hospitals. Dr. Clingan explained that his experience was that nurses from the smaller hospitals were more qualified as most of the work in the larger hospitals was done by internes, and the nurses from larger hospitals therefore lacked confidence in themselves. Dr. Bardal stated he did not think the questionnaire should be excluded from doctors in hospital towns. Dr. Cunningham advised that he had considerable experience in employing nurses and he felt it depended entirely on the nurse herself. Dr. Dicks agreed with Dr. Bardal and the questionnaire should be forwarded to towns where there are hospitals. Dr. Jackson stated they were obliged to make some endeavor to get information for the President of the University, and he felt the questionnaire was

about the only means of doing so. Dr. Thorlakson suggested that if this was the case, a further question should be added as follows: Is there a training school in your district, if so, at what point?

It was moved by Dr. S. Bardal, seconded by Dr. J. D. Adamson: That this questionnaire with the addition of the extra question as suggested by Dr. Thorlakson be sent to all members of the profession in Manitoba outside of Greater Winnipeg. —Carried.

FEDERATION.

The Secretary explained that the Executive were no further ahead in this matter, as Dr. McKenty, Chairman of the Committee, has had severe illness in his family and has been out of the City for a considerable time, but that Dr. Moorhead desired some information to take East with him. Dr. Moorhead advised that he had spoken to Dr. McKenty recently and Dr. McKenty intended to prepare a few general principles dealing with the relationship of the British North American Act and provincial autonomy. Dr. Moorhead advised it was now recognized that this matter could not be rushed and it would take perhaps three to five years to come to a decision. Dr. Moorhead stated he would get what details he could from Dr. McKenty to take to the Canadian Medical Association Meeting, and would report back to this Executive.

REPORT OF CHAIRMAN OF COMMITTEE ON SOCIOLOGY.**Refractions.**

Dr. Moorhead addressed the meeting and stated he had attended several meetings of the City on this matter, and that he was very pleased to report this had for the time being been satisfactorily adjusted and that the contract with the oculists had been renewed until May 1st next.

Statistical Analysis.

Dr. Moorhead advised a survey had been made on the first year's operation of the medical relief plan, and the survey on the second year's operation was now being carried on and a statistician and two stenographers were employed. He stated that both Dr. Jackson and himself had recently been up to the office but were disappointed in the advance being made on this work, as it was not finished and the end was not even in sight. Dr. Moorhead advised he had sent a letter to the panel practitioners in the City suggesting that the surplus fund be used to install the Hollerith system for compiling this information. The Hollerith machine now in use in the Relief offices could be used and it would only necessitate employing someone to run it and a supply of the necessary cards. Dr. Moorhead stated that the City were not interested in any statistics other than the financial end, whereas the Sociology Committee desired statistics on the morbidity, as these were repeatedly being asked for from points throughout Canada.

Dr. Adamson addressed the meeting and stated that the funds accruing should be properly defined. He stated it was not definitely set out whether this fund was the property of the Sociology Committee or of this Association, and he felt that it was to Dr. Moorhead's interests that this be definitely cleared up.

Dr. McGuinness spoke and stated that this money is in a trust fund of the Manitoba Medical Association and the authority for the expending of same is in the hands of this Executive.

Copies of contract signed by the practitioners with the City, authority for the five per cent deduction, and previous minutes authorizing the setting up of this fund, were read. On the suggestion of Dr. McGuinness it was decided that a proper amendment should be made to the last motion passed at meeting on November 26th, 1934, page 0398, to allow the Committee on Sociology to undertake the proposed expenditure.

It was moved by Dr. E. S. Moorhead, seconded by Dr. J. D. Adamson: That this Executive authorize the Committee on Sociology to expend the necessary funds for the carrying out of a permanent statistical record for the Winnipeg medical relief services.

—Carried.

COMMITTEE ON ECONOMICS OF CANADIAN MEDICAL ASSOCIATION.

Following discussion, it was moved by Dr. J. D. Adamson, seconded by Dr. F. G. McGuinness: That the Chairman of the Committee on Sociology, and the Secretary of the Manitoba Medical Association, be the two representatives for Manitoba on the Economic Committee of the Canadian Medical Association.

—Carried.

AGENDA OF THE EXECUTIVE COMMITTEE OF THE CANADIAN MEDICAL ASSOCIATION.

Dr. Moorhead reviewed the agenda of the Canadian Medical Association Executive Committee, which meeting he is going to attend, and asked the Executive for instructions in regard thereto.

1. Should Ontario Practitioners who are O.M.A. members be asked to pay the C.M.A. membership fee when registering at Ottawa meeting?

Following discussion the meeting felt that any time there were meetings held in Manitoba, fees were always paid.

2. Appointment of Chairman of Committee on Legislation.

This is left to Dr. Moorhead's own judgment.

3. Medical Economics—Consideration of the recommendation regarding the Appointment of an Associate Secretary to deal with Medical Economics.

It was felt that the appointment of an associate secretary to work on the question of medical economics was desirable, but that the name or names submitted should be sent to the Western Provinces for their approval, and whoever receives the appointment should be a resident of the West.

4. Radio Reception.

This question is left to Dr. Moorhead's discretion in any discussion on the subject.

5. Extra-mural Post Graduate Speakers to the Maritimes and to Alberta and Saskatchewan.

Discussion of this took place and as it was not understood it was left in abeyance for Dr. Moorhead to deal with.

6. Health Insurance—Letter from Dr. Milburn re. Barrett's Tentative Plan.

This subject was not understood and it was left in abeyance for Dr. Moorhead to deal with.

7. Medical men practising in drought areas in Provinces of Manitoba, Saskatchewan and Alberta.

Discussion of this took place and some of the executive felt that if the attention of the Dominion Government was drawn to the fact that there was no provision for medical services, that they would make arrangements. Other members, however, felt that this would not be done and pressure should be brought to get action. A suggestion was made that a definite answer be obtained from the Government whether they are concerned or not, and possibly Dr. Moorhead could get in touch with the Alberta and Saskatchewan authorities and present a unified front to obtain relief for these areas. Dr. Moorhead was instructed that it is the opinion of this Executive that doctors in drought areas should be paid.

PLACE AND DATE OF ANNUAL MEETING.

It was moved by Dr. W. G. Campbell, seconded by Dr. E. K. Cunningham: That the 1937 Annual Meeting of this Association be held in the City of Winnipeg, and that it be held in the month of May during

the week of convocation, as may be arranged by the Secretary.

—Carried.

RE. SPECIALISTS.

Dr. Campbell read a report submitted to the College of Physicians and Surgeons by a Committee appointed for the purpose of studying this matter.

Dr. Trainor advised that he felt the general practitioner should have representation on any Committee discussing this subject, and there should be some co-ordination between the general practitioner and specialists. He felt, as Dr. Campbell pointed out, the College of Physicians and Surgeons who represent the legal body of the profession, should have the authority for dealing with such a question. Further discussion followed by Drs. Moorhead, Jackson, Clinigan and Trainor, Dr. Campbell finally stating he would forward a typewritten copy of the report to each member of the Executive.

It was moved by Dr. O. C. Trainor, seconded by Dr. R. E. Dicks: That a Committee be appointed to take charge of this.

Dr. Thorlakson pointed out a Committee had already been formed, consisting of Dr. Mathers, Dr. Adamson and himself, by the Canadian Medical Association under the Chairmanship of Dr. Gunn.

Dr. Jackson then read a resolution to the Executive of the Medical Council of Canada contained in their letter of December 20th, 1935.

It was moved by Dr. F. G. McGuinness, seconded by Dr. E. K. Cunningham: That Dr. Trainor be Chairman of a Committee of this Executive to deal with this subject.

It was moved by Dr. Trainor: That Dr. Gunn be on this Committee as well as a number of specialists and a number of general practitioners, preferably not more than six.

The President asked Dr. Trainor if he would accept the chairmanship of this Committee and have Dr. Gunn work with him with power to add.

Dr. Trainor accepted.

MEMBERSHIP.

The Secretary advised that the letter which was suggested to be forwarded to all members in arrears, had been sent out and only one fee had been collected, but a number of letters criticising it were received.

Discussing the subject Dr. Thorlakson stated that a page in the back of the Review should be set aside and a list of all the members of the Association in good standing published in each month's issue, as he felt this would be a good reminder for doctors to join, and in the front of the book an application or slip could be attached.

The Secretary read resolution passed at the last Annual Meeting of the Association, amending the Constitution whereby ordinary members of the Association shall remain members until they formally resign etc., page 0478 minute book.

It was moved by Dr. P. H. T. Thorlakson, seconded by Dr. O. C. Trainor: That if satisfactory to the Editor of the Review, that this list of names be published in the Review commencing with the January issue.

—Carried.

Dr. McGuinness suggested that the matter of the amendment to the constitution in connection with membership as put through at the last annual meeting, should be reconsidered and if advisable be revised further.

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Department of Health and Public Welfare

NEWS ITEMS

DIABETES AS A PUBLIC HEALTH PROBLEM: The following are excerpts taken from an article prepared by Charles F. Bolduan, M.D., and Herman Lande, M.D., regarding "Diabetes as a Public Health Problem" and "The Preventive Aspects of Diabetes" which we hope will prove as interesting to Medical Officers of Health and practising physicians as it has to the members of this Department:—

DIABETES AS A PUBLIC HEALTH PROBLEM

Charles F. Bolduan

"Diabetes is a far greater public health problem than is generally realized. To attack this problem successfully we must have a sound statistical foundation. The disease is not reportable; hence most of our statistical data are based on mortality experience. Careful analysis of the available mortality statistics shows that in many respects the published mortality data are misleading. They seem to indicate that the prevalence of diabetes is rapidly on the increase, that this increase is confined almost exclusively to women, that fifty or sixty years ago diabetes was a rare disease, and that then it was more common among men than among women.

We know that diabetes is a very prevalent condition, and that it is more common among women than among men. We believe that diabetes was always a prevalent disease, but was largely unrecognized, and that it has always been more prevalent among women than among men.

Inasmuch as diabetes is usually associated with later adult life, the aging of the population has undoubtedly brought with it an actual increase in the proportion of diabetics in the community. There is, however, no evidence that in any particular age groups, e.g., 45-55 or 55-65, diabetes is any more prevalent now than it was forty or fifty years ago.

Much diabetes is still unrecognized, due to the failure of physicians to make tests of the urine for sugar on all their patients. With an appreciation of the great prevalence of this disease such tests should become an established routine.

While we know that diabetes is more prevalent among Jews than among non-Jews, we do not know the cause of this difference. Inasmuch as heredity plays a part in diabetes, the more frequent intermarriage of Jews must be borne in mind as a factor.

The difference in diabetes mortality between single females on the one hand, and married and widowed on the other is suggestive of pregnancy as a factor in diabetes. Joslin, to be sure, ascribes the difference to obesity. The point deserves further study.

A considerable number of diabetics still die as the result of diabetic coma. This is a preventable condition demanding, on the one hand obedience on the part of the patient to the physician's instructions, on the other familiarity on the part of the physicians with the clinical management of diabetes.

Many diabetics require surgical treatment. Experience shows that this is most likely to be successful when there is the closest co-operation between a hospital's medical and surgical services in the management of each individual case.

A generation ago the diagnosis of diabetes in an individual usually denoted only two or three years more to live; now, with the aid of insulin, many diabetics live out a normal life span. In this connection it is interesting to see how the average age at

death of diabetics has increased since the introduction of insulin.

There is need of much popular health education in order to have all diabetics under the care of qualified physicians. The field is exploited by quacks and nostrum venders who promise the victims cures by means of waters, herb teas, and alleged substitutes for insulin.

THE PREVENTIVE ASPECTS OF DIABETES: There are few chronic diseases of middle life for which the therapeutic and preventive indications are as clearly defined as diabetes. The prolongation of life effected by the discovery and utilization of insulin has made possible statistical studies through which we have acquired a new understanding of certain etiological factors. It is still a matter of controversy whether diabetes is due essentially to a deficiency of insulin or whether it is the result of a physiological imbalance involving several endocrine glands. However, our lack of knowledge of the exact mechanism does not invalidate the evidence that diabetes is hereditary. The studies of White and Pincus are based on the following observations:

1. The almost simultaneous development of diabetes in both members of pairs of identical twins.
2. The greater incidence in blood relatives than in the control population.
3. The demonstration that Mendelian ratios of the recessive type are found in large series of cases selected at random.
4. The demonstration of expected ratios in presumably latent cases. Their investigations have been carefully controlled and the transmission of the responsible genetic factor as a Mendelian recessive is generally accepted.

Their investigations have been carefully controlled and the transmission of the responsible genetic factor as a Mendelian recessive is generally accepted.

The evidence implicating obesity is equally convincing. Between 70 and 80 per cent of diabetics are overweight. A study of individuals accepted for insurance is even more striking. Diabetes develops in a much greater proportion in the overweight, 136 per 100,000 in contrast to 6 per 100,000 in the underweight. Furthermore, the liability to diabetes increases with the degree of obesity. Its increasing incidence with advancing age holds true only for the overweight. Its incidence in various occupations and in various strata of society may be explained largely by the presence of obesity.

Further investigations have demonstrated the increased incidence of diabetes in women at the menopause. This observation strongly suggests the etiological significance of endocrine imbalance with especial involvement of the pituitary. The endocrine factor carries its usual vague implications but the significance of an age of increased susceptibility in the predisposed should be borne in mind.

A temporary depression of carbohydrate tolerance during an acute infection is not uncommon. Diabetes mellitus, however, is rarely if ever of infectious origin. There are no indications for the wholesale eradication of suspected tonsils and teeth. The relationship of gall-bladder disease and diabetes is, however, more significant. The removal of an infected gall bladder or the relief of biliary obstruction may produce a marked improvement of the diabetic status or, in rare instances, the restoration of normal carbohydrate tolerance.

Clinical and laboratory studies have demonstrated the value of exercise in improving glucose utilization. This is not surprising when one considers that 50 per cent of the carbohydrate of the body is stored in the musculature and a large proportion burned there.

The prophylactic measures available to combat the increasing incidence of diabetes are implicit in our knowledge of the etiological factors. First of all we must concentrate on the diabetic and his family. The possibility that the potential diabetics might be selected from those of diabetic heredity by sugar tolerance tests suggest itself but studies based on this test do not warrant its general application. Furthermore, the evaluation of hereditary factors in any particular case is often rendered difficult by the fact that diabetes usually develops in the latter decades of life. There are, however, certain preventive measures that are definitely indicated:

1. When diabetes or diabetic heredity exists the further transmission can be controlled or completely avoided only if the chosen partner in marriage is a non-diabetic of a non-diabetic family.
2. Every effort should be made to prevent the development of overweight in all members of the diabetic family. Relatives should never be allowed to weigh above the normal standard and after the fourth decade should keep 5 to 10 per cent below the standard.
3. The increased susceptibility at the age of menopause is an especial indication for dietetic regulation in the predisposed. There is no evidence to suggest that any known pituitary or ovarian extract will be of value.
4. Diabetic heredity is an additional indication for the surgical eradication of gall-bladder disease.
5. The value of exercise in the utilization of sugar should be explained to the predisposed.
6. In 50 per cent of cases the onset of diabetes is insidious and unaccompanied by symptoms. Urinary and blood studies should therefore be made at regular intervals in those of diabetic heredity after the fourth decade. Such studies should be made after a full breakfast. A mild diabetes can be overlooked if studies are restricted to the fasting blood and urine."

COMMUNICABLE DISEASES REPORTED

Urban and Rural - September, 1936.

Occurring in the Municipalities of:

Anterior Poliomyelitis: Total 202—Winnipeg 41, Selkirk 11, Woodworth 10, Stanley 8, Neepawa 9, Elton 7, Morton 7, Roblin Rural 7, Whitewater 7, Rosedale 6, Lansdowne 5, Louise 5, Brandon 4, Grey 4, Langford 4, St. Andrews 4, St. Vital 4, Charleswood 3, Gretna 3, Sifton 3, St. Boniface 3, St. James 3, Carman 2, Cyprus South 2, Norfolk North 2, Oakland 2, Portage Rural 2, Rossburn Town 2, Turtle Mountain 2, Unorganized 2, Argyle 1, Daly 1, Winnipeg Beach 1, Hillsburg 1, Kildonan West 1, Kildonan East 1, Odanah 1, Pembina 1, Rhineland 1, Roland 1, Shellmouth 1, Strathcona 1, Westbourne 1, Whitehead 1 (Late Reported: June, Morton 1, July, Boissevain 1, Morton 1, August, Boissevain 1, Morton 5, Selkirk 3, St. Andrews 1).

Scarlet Fever: Total 169—Winnipeg 110, St. James 8, Portage Rural 6, Bifrost 6, Grandview Rural 4, St. Boniface 4, The Pas 4, Louise 3, Lawrence 3, Transcona 3, Gilbert Plains Rural 2, Selkirk 2, Argyle 1, Brandon 1, Brooklands 1, Pembina 1, Portage City 1, Siglunes 1, St. Vital 1, Westbourne 4, Unorganized 1, Whitemouth 1, Woodlands 1.

Chicken Pox: Total 54—Winnipeg 28, MacDonald 14, West Kildonan 3, North Norfolk 2, Lac du Bonnet 2, Lorne 1, Rockwood 1, St. James 1, Turtle Mountain 1, Brooklands 1.

Measles: Total 58—Virden 18, Unorganized 9, Siglunes 6, Stonewall 5, Emerson 4, Kildonan West 3, Wallace 2, Winnipeg 2, Brandon 1, Sifton 1, Whitemouth 1 (Late Reported: June, Unorganized 1, July, Ellice 2, August, Unorganized 3).

Tuberculosis: Total 41—Unorganized 4, Dauphin Town 2, Neepawa 2, Shell River 2, Assiniboia 1, Carman 1, Elton 1, Fort Garry 1, Grandview Town 1, Harrison 1, Hillsburg 1, Kildonan East 1, Lansdowne 1, Lorne 1, MacDonald 1, Minnedosa 1, Portage Rural 1, Rockwood 1, Russell 1, Sifton 1, Springfield 1, St. Andrews 1, St. Boniface 1, Winnipeg 12.

Mumps: Total 19—Winnipeg 11, North Norfolk 4, Dauphin Town 1, Louise 1, Morton 1, St. Andrews 1.

Typhoid Fever: Total 14—Shellmouth 6, Portage City 3, Assiniboia 1, Desalaberry 1, Neepawa 1, Siglunes 1 (Late Reported: May, Hanover 1).

Whooping Cough: Total 13—Winnipeg 6, Unorganized 3, Selkirk 2, Shellmouth 1, Ethelbert 1.

Diphtheria: Total 12—Winnipeg 8, Dufferin 2, Fort Garry 1, Minitonas 1.

Erysipelas: Total 8—Winnipeg 4, Morris Rural 1, St. James 2, Whitewater 1.

Influenza: Total 3—(Late Reported: March, Lorne 1, July, Brandon 1, Roland 1).

Puerperal Fever: Total 2—Grandview Town 1, Riverside 1.

Septic Sore Throat: Total 2—Tuxedo 2.

Diphtheria Carrier: Total 1—(Late Reported: July, Hanover 1).

Veneral Disease: Total 121—Gonorrhoea 91, Syphilis 30.

DEATHS FROM ALL CAUSES IN MANITOBA

For the Month of August, 1936.

URBAN—Cancer 55, Pneumonia 10, Tuberculosis 5, Infantile Paralysis 3, Chicken Pox 1, Diphtheria 1, Lethargic Encephalitis 1, Syphilis 3, Measles 1, all others under one year 2, all others 161, Stillbirths 10. Total 253.

RURAL—Cancer 23, Pneumonia 13, Tuberculosis 10, Infantile Paralysis 4, Influenza 3, Lethargic Encephalitis 1, Puerperal Septicaemia 1, Erysipelas 1, Syphilis 1, all others under 1 year 5, all others 138, Stillbirths 18. Total 218.

INDIAN—Tuberculosis 14, Pneumonia 4, Measles 2, all others under 1 year 1, all others 20. Total 41

OBITUARY

DR. JOHN McDIARMID

Dr. John McDiarmid, who was associated with the life of Brandon from its inception and was Mayor of the city for five years, died on October 16th, in his ninety-first year. When he arrived fifty-four years ago he was the only physician in the town, then only a pioneer settlement. He carried on practice until 1914 when he retired, but retirement brought no slackening in his community interest. He was a member of the Session of St. Paul's United Church and Past-Master of the Masonic Lodge.

He was born in Fingal, Ont., and graduated in medicine from Trinity College, Toronto. He practised for a time in Brainsstone, and came to Brandon in 1882.

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A summary of the contents of some of the journals available for practitioners, submitted by the Faculty of Medicine of the University of Manitoba. Compiled by T. E. HOLLAND, B.Sc., M.D. (Man.), F.R.C.S. (Edin.).

**"The Journal of the American Medical Association"—
October, 1936.**

"Poliomyelitis": Present knowledge of its bearing on Control—by J. P. Leake, M.D., Medical Director of U. S. Public Health Service, Washington, D.C.

A paper read at the Annual Meeting of the American Medical Association May, 1936. Abstract of discussion is included.

"The Massive Bone Graft in Ununited Fractures"—by Melvin S. Henderson, M.D., Rochester, Minn.

Bony union obtained in 84.5 per cent.

"Present Status of the x-rays as an aid in the the treatment of Gas Gangrene"—by James F. Kelly, M.D., and D. Arnold Dowell, M.D., Omaha.

"Osteomyelitis at Cook County Hospital" With an appraisal of Orr's Method of Treatment—by Marcus H. Hobart, M.D., and Donald S. Miller, M.D., Chicago.

**"The Journal of the American Medical Association"—
October, 1936.**

"Present Status of Dietary Regimens in Urinary Infections"—by Anson L. Clark, M.D., Oklahoma City.

Diet lists and results are given. The opinion is expressed that Mandelic Acid has proven to be an effective urinary antiseptic and should be tried before the ketogenic diet.

"Internal Hernia following Round Ligament Suspension"—Report of two cases—by M. A. Michael, M.D., Philadelphia.

"Fibrositis"—by W. S. C. Copeman, M.D., M.R.C.P., London.

A comprehensive paper read at the Mayo Clinic, June, 1936.

**"The Canadian Medical Association Journal"—
October, 1936.**

"Malignant Nephrosclerosis (Malignant Hypertension)—by Leyland J. Adams, M.D., C.M., Montreal.

"Carcinoma Originating in Sebaceous Cysts"—by Donald C. Collins, M.D., M.S. (Surgery), M.S. (Pathology), Los Angeles.

Three cases are recorded. The author states that all sebaceous cysts should be considered as pre-cancerous lesions.

"Embolism and Sudden Thrombosis of the Arteries of the Extremities"—by Robert S. McKechnie, M.D., C.M., Fellow in Surgery, The Mayo Foundation, Rochester, Minn.

"The Practitioner"—October, 1936.

This number contains articles on Advances in Diagnosis and Treatment 1935-36, among which are the following:

- "Medical Progress 1935-36"—by Sir Maurice Cassidy, K.C.V.O., C.B., M.D., F.R.C.P.
- "Surgical Progress"—by Sir David Wilkie, M.D., Ch.M., F.R.C.S.
- "Diseases of the Alimentary Canal"—by Arthur F. Hurst, F.R.C.P.
- "Acute Abdominal Disease"—by V. Zachary Cope, M.D., F.R.C.S.
- "Cardiovascular Disorders"—by William Evans, M.D., F.R.C.P.
- "Diseases of the Blood-Forming Organs"—by John F. Wilkinson, M.D., F.R.C.P.
- "Diseases of the Lungs and Pleurae"—by Maurice Davidson, M.C., F.R.C.P.
- "Nervous Disorders"—by MacDonal & Critchley, M.D., F.R.C.P.
- "Diseases of Children"—by Alan Moncrieff, M.D., F.R.C.P.

INTRODUCING**MR. R. STUART McDUFFEE**

Mr. Tom Moffat Matheson, who has for the past ten years represented Messrs. Oppenheimer Son & Co., Ltd., of London, England, in Western Canada, has been transferred to Vancouver and will be in Winnipeg on less frequent visits in the future.

Medical contacts on behalf of Messrs. Oppenheimer and also Messrs. Beiersdorf Ltd., of England, will be maintained by Mr. R. Stuart McDuffee.

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- "Psychological Medicine"—by H. Devene, M.C., F.R.C.P.
- "Rheumatic Diseases"—by C. W. Brickley, M.D., F.R.C.P.
- "Acute Infectious Diseases"—by William Gunn, M.B., M.R.C.P., D.P.H.
- "Allergic Diseases"—by George W. Bray, M.B., M.R.C.P.
- "Endocrine Disorders"—by H. Gardiner-Hill, M.D., F.R.C.P.
- "Obstetrics and Gynaecology"—by Douglas MacLeod, M.S., M.R.C.P., F.R.C.S.
- "Diabetes Mellitus"—by Otto Leylon, M.C., F.R.C.P.
- "Renal Disease"—by T. Izod Bennett, M.D., F.R.C.P.
- "Inoperable Cancer"—by John Hosford, M.S., F.R.C.S.

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